Configure, Verify, and Troubleshoot IPv6 Addresses

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IPv6 Configuration and Troubleshooting Lab

Overview

Demonstrated hands-on experience with IPv6 configuration and troubleshooting on Cisco routers using Packet Tracer. This lab showcases my ability to design, configure, and troubleshoot IPv6 addresses, ensuring seamless network connectivity.

Objectives

- Configure IPv6 addresses on Cisco routers
- Verify IPv6 configuration using show commands
- Troubleshoot IPv6-related issues using debug and show commands

Technical Skills

- IPv6 addressing and configuration
- Cisco router configuration and verification
- Troubleshooting IPv6-related issues
- IPv6 unicast-routing and its applications

Methodology

- Designed and configured a network topology using Packet Tracer
- Configured IPv6 addresses on Serial and Loopback interfaces
- Enabled IPv6 unicast-routing on Cisco routers
- Verified IPv6 configuration using show commands (e.g., show ipv6 int brief)
- Troubleshooted IPv6-related issues using debug and show commands

Deliverables

- Fully configured and functional IPv6 network on Cisco routers (Packet Tracer file)
- Detailed report on configuration, verification, and troubleshooting processes
- Screenshots of configuration and verification outputs

Tools and Resources

- Packet Tracer software
- Cisco router IOS (simulated)
- IPv6 addressing scheme

Takeaways

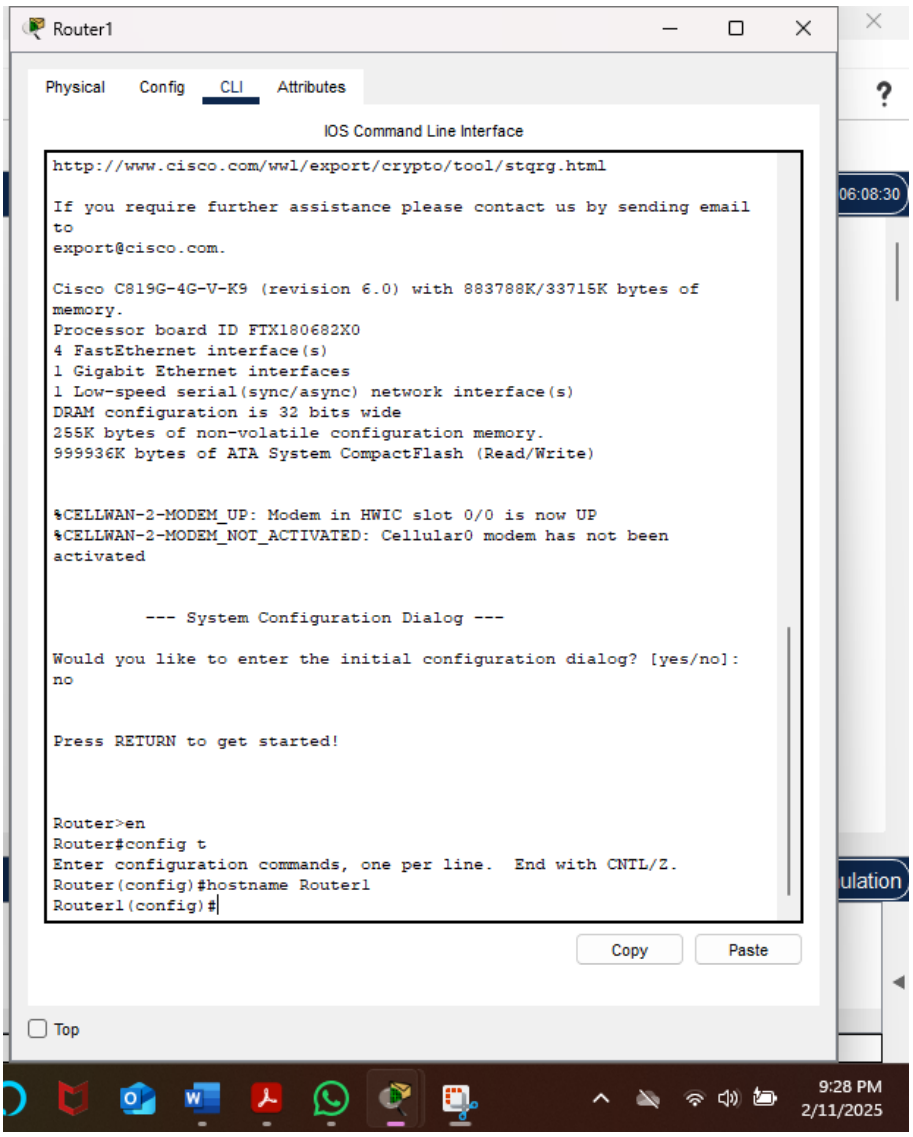
- Gained hands-on experience with IPv6 configuration and troubleshooting on Cisco routers using Packet Tracer
- Demonstrated ability to design, configure, and troubleshoot IPv6 addresses
- Developed troubleshooting skills using debug and show commands

Feel free to connect with me to discuss this project or any other networking-related topics!

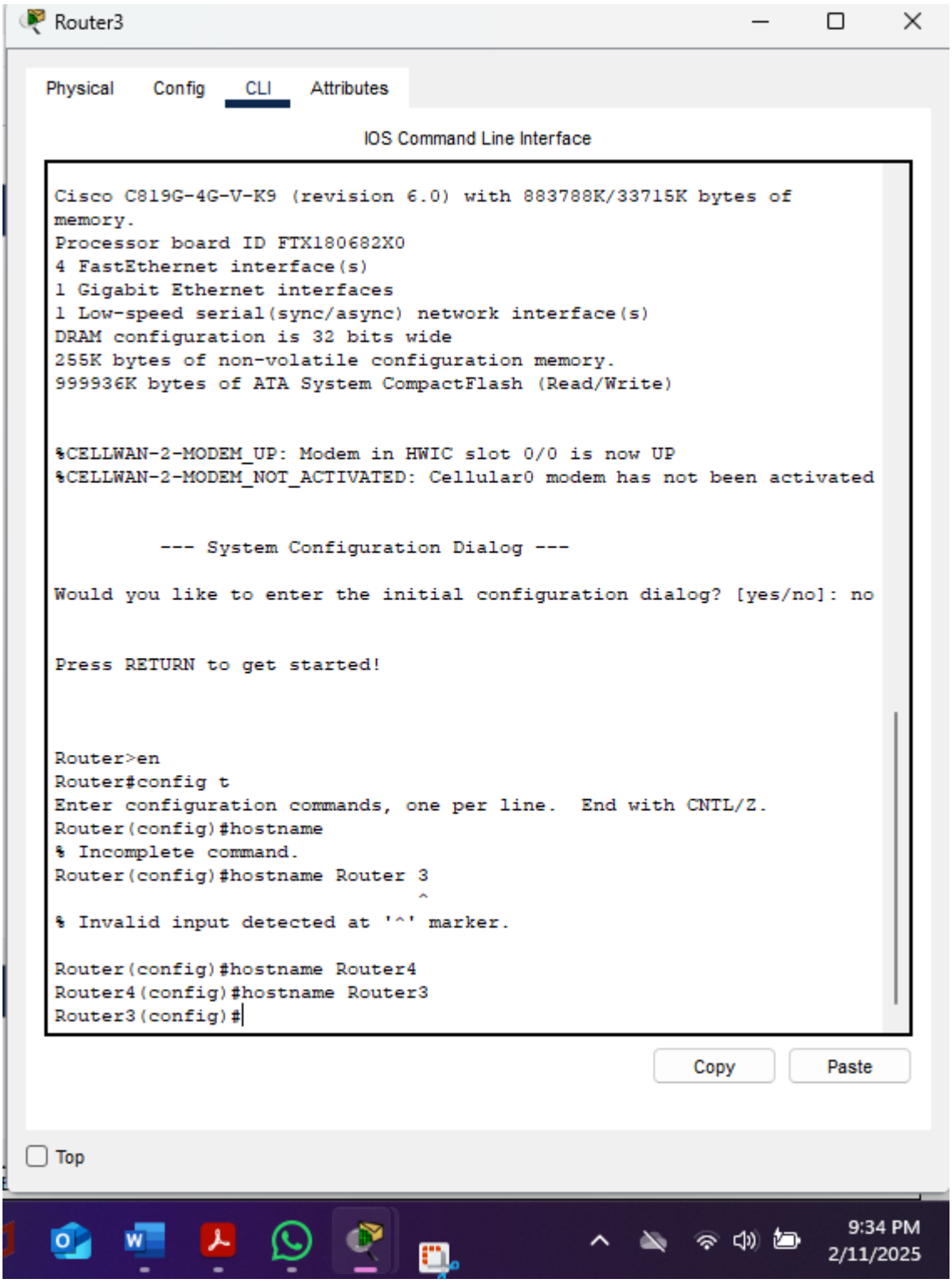
Task Summary

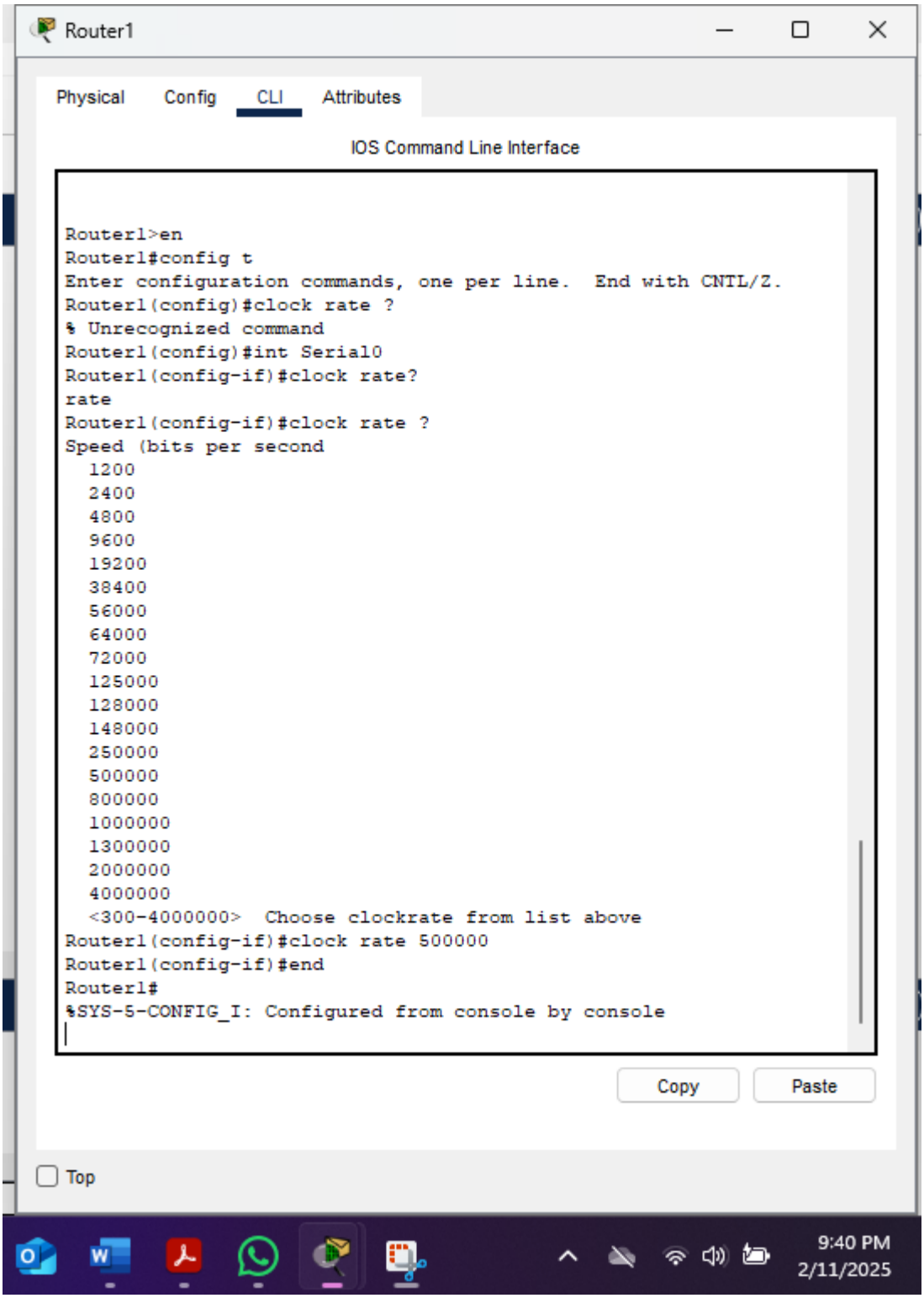
Task 1: Configure Hostnames

Configured hostnames on routers R1 and R3.



So, I used the 819HGW routers and connected them using Serial 0. I will then move into the CLI to configure hostnames in which you will see on the screenshot on the left.


Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
Cisco C819G-4G-V-K9 (revision 6.0) with 883788K/33715K bytes of memory.
Processor board ID FTX180682X0
4 FastEthernet interface(s)
1 Gigabit Ethernet interfaces
1 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 32 bits wide
255K bytes of non-volatile configuration memory.
999936K bytes of ATA System CompactFlash (Read/Write)
%CELLWAN-2-MODEM_UP: Modem in HWIC slot 0/0 is now UP
%CELLWAN-2-MODEM_NOT_ACTIVATED: Cellular0 modem has not been activated
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]: no
Press RETURN to get started!
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname
% Incomplete command.
Router(config)#hostname Router 3
^
% Invalid input detected at '^' marker.
Router(config)#hostname Router4
Router4(config)#hostname Router3
Router3(config)#
Copy
Paste
Top
9:34 PM
2/11/2025

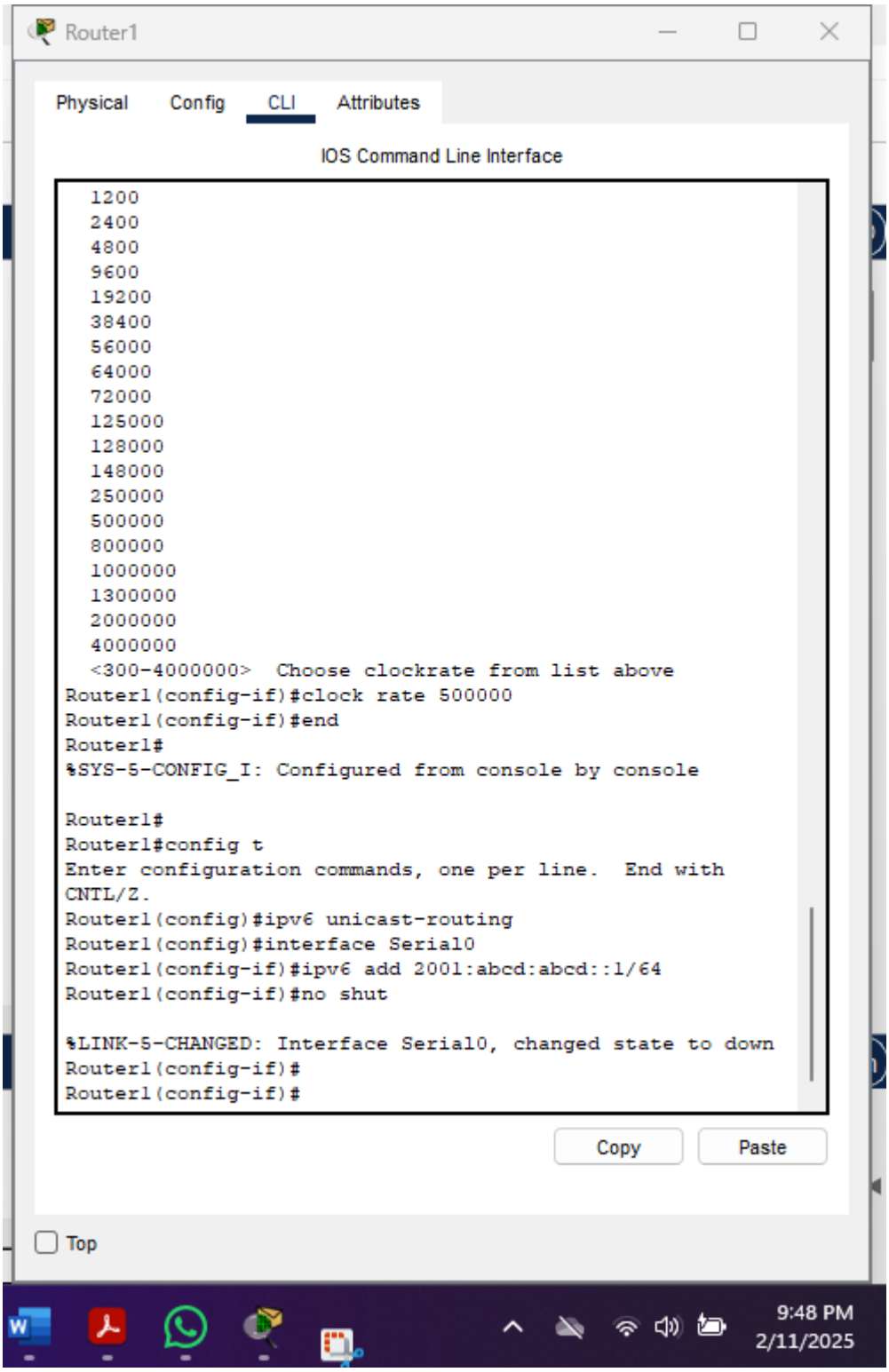


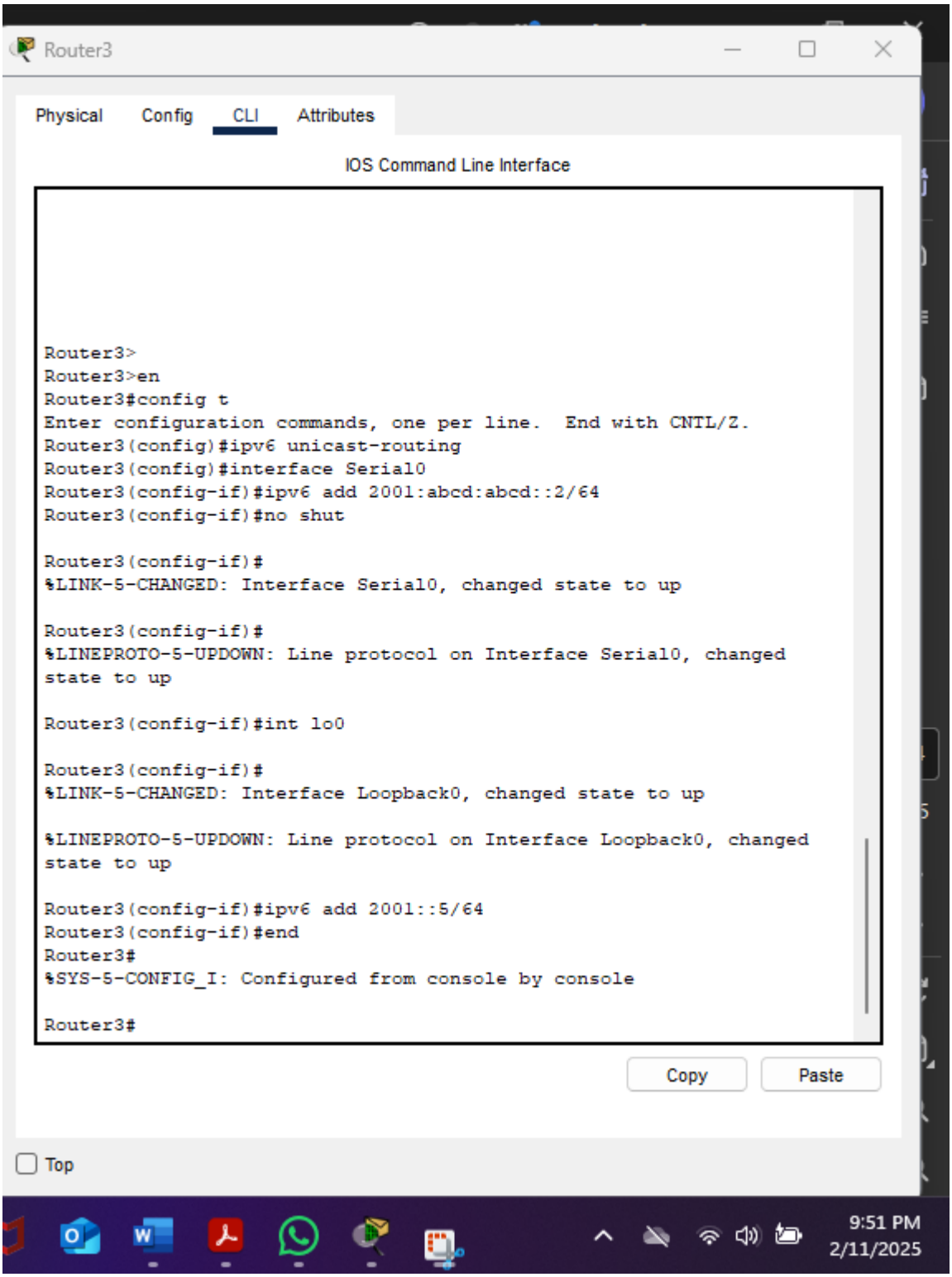
Now that we have our topology set up and our hostnames configured , let's start configuring our routers with the clock

We are going to configure Router1 Serial0 as a DCE

Router1 Serial0 interface is a Data Circuit-terminating Equipment (DCE) device, which means it provides the clocking signal to the receiving device. We'll configure it to provide a clock rate of 500 Kbps to Router3.

Let’s go ahead and configure some ip addresses on these serial interfaces




Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router3>
Router3>en
Router3#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router3(config)#ipv6 unicast-routing
Router3(config)#interface Serial0
Router3(config-if)#ipv6 add 2001:abcd:abcd::2/64
Router3(config-if)#no shut
Router3(config-if)#
%LINK-5-CHANGED: Interface Serial0, changed state to up
Router3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed state to up
Router3(config-if)#int lo0
Router3(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
Router3(config-if)#ipv6 add 2001::5/64
Router3(config-if)#end
Router3#
%SYS-5-CONFIG_I: Configured from console by console
Router3#
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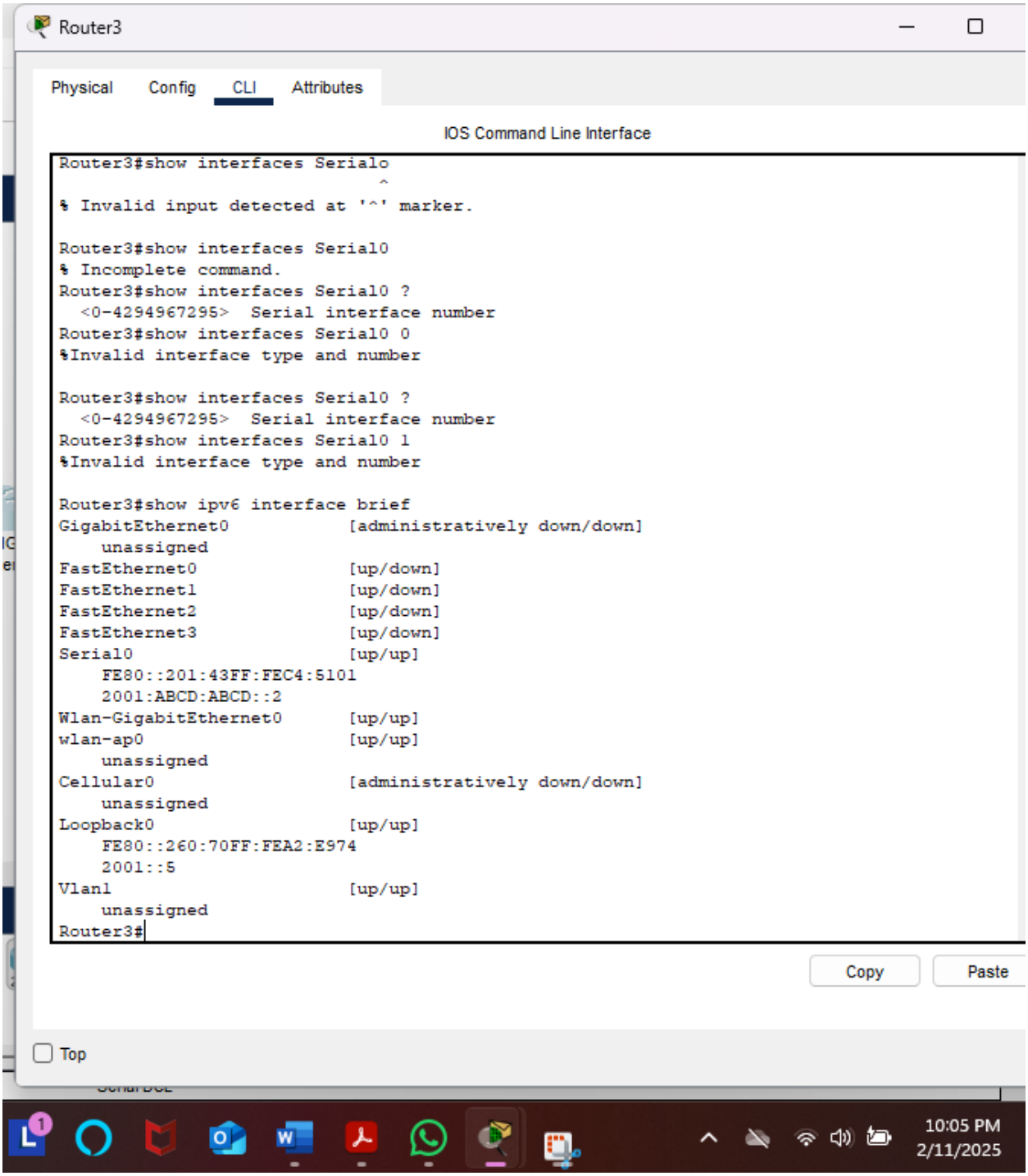
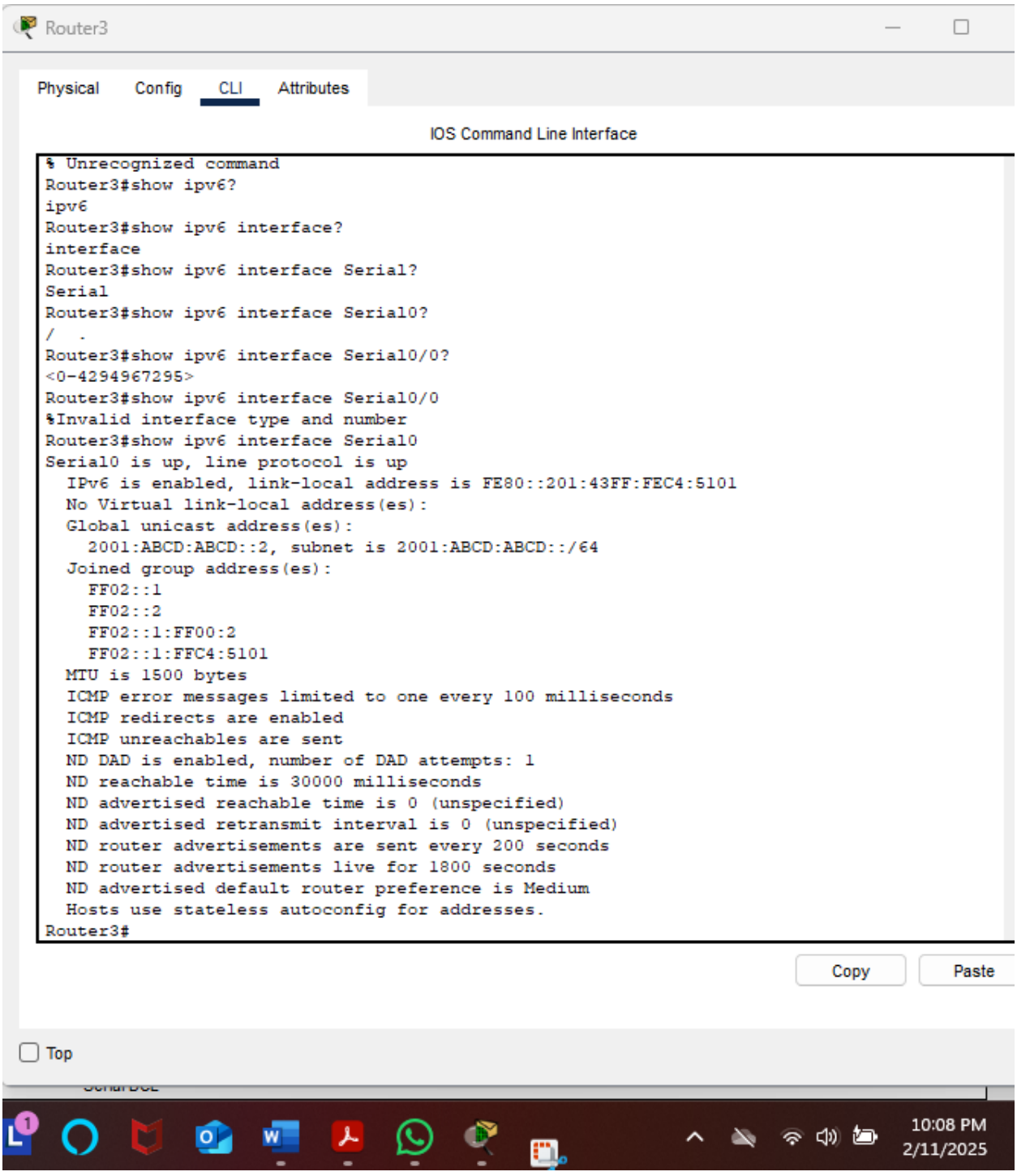
For this last step we are just going to verify using show ipv6 interface brief as well as a show ipv6 interface Serial0 command on router 3.




Router3
Physical
Config
CLI
Attributes
IOS Command Line Interface
% Unrecognized command
Router3#show ipv6?
ipv6
Router3#show ipv6 interface?
interface
Router3#show ipv6 interface Serial?
Serial
Router3#show ipv6 interface Serial0?
/ .
Router3#show ipv6 interface Serial0/0?
<0-4294967295>
Router3#show ipv6 interface Serial0/0
%Invalid interface type and number
Router3#show ipv6 interface Serial0
Serial0 is up, line protocol is up
IPv6 is enabled, link-local address is FE80::201:43FF:FEC4:5101
No Virtual link-local address(es):
Global unicast address(es):
2001:ABCD:ABCD::2, subnet is 2001:ABCD:ABCD::/64
Joined group address(es):
FF02::1
FF02::2
FF02::1:FF00:2
FF02::1:FFC4:5101
MTU is 1500 bytes
ICMP error messages limited to one every 100 milliseconds
ICMP redirects are enabled
ICMP unreachables are sent
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 (unspecified)
ND advertised retransmit interval is 0 (unspecified)
ND router advertisements are sent every 200 seconds
ND router advertisements live for 1800 seconds
ND advertised default router preference is Medium
Hosts use stateless autoconfig for addresses.
Router3#
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Top
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